

**REMARKS/ARGUMENTS**

The Office Action mailed May 21, 2003, has been received and reviewed. Claims 1 through 25 are currently pending in the application. Applicant affirms the election to prosecute the invention of Group I, claims 1 through 12. Claims 13 through 25 are withdrawn as being drawn to a non-elected invention. Claims 1 through 12 stand rejected. Applicant has amended claims 1 through 6, 8 through 13 and 15 through 22, and respectfully requests reconsideration of the application as amended herein.

**Restriction Requirement/Election**

The Examiner states that restriction of the present application is required under 35 U.S.C. 121 and 372 as containing multiple inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT rule 13.1. Applicant hereby affirms the election to prosecute the invention set forth in group I, claims 1-12 with traverse.

With regard to the imposed restriction requirement, the Examiner states the following:

The inventions listed in Groups I [claims 1-12] and II [claims 13-25] do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

- The special technical feature (STF) of Group I is a plurality of injection devices spaced along an elongated passageway and having a flow control device for regulating a flow of disinfectant source and conduit arrangement.
- The STF of Group II is introducing a disinfectant into wastewater flowing through an elongate path and controlling the dosage of disinfectant to each of a plurality of dosing locations. (Office Action, page 3).

The Examiner further states:

The features that both groups [have] in common include spaced injection and flow control from a source of disinfectant. However these features are already known in the art—e.g. the British Reference 1,263,916. [Therefore], those features do not define a contribution over the art and unity of invention is lacking. (Office Action, pages 2 and 3).

Applicant submits that restriction is not proper under PCT rule 13.1 and 13.2 and that the inventions set forth in Groups I and II are directed to a single general inventive concept and share corresponding special technical features.

The Examiner acknowledges that both groups of inventions have common features which includes a source of disinfectant and flow control of such disinfectant. Furthermore, the Examiner notes (in assessing what the Examiner deems to be the special technical features) that each Group of inventions contain the following:

GROUP I	GROUP II
...a plurality of injection devices...	...dosage of disinfectant at <i>a plurality of dosing locations</i> ...
...an elongated passageway...	...wastewater flowing through <i>an elongate pathway</i> ...
...a flow control device for regulating flow of disinfectant...	...controlling the dosage of disinfectant...

(See Office Action, page 2, numbered paragraph 2).

Applicant submits that there is general correspondence regarding the above-listed subject matter of the two groups of inventions. Applicant further submits that the invention of Group I includes the following subject matter: "the at least one flow control device is configured to

*provide a lesser regulated flow of disinfectant through each injection device than a regulated flow of disinfectant through an injection device located upstream therefrom.”* (Claim 1). The invention of Group II includes the following similar or corresponding subject matter:

*“controlling a dosage of disinfectant to each of the plurality of dosing locations wherein each dosage of disinfectant is less than a dosage of disinfectant introduced into the waste water at a dosing location upstream thereof.”* (Claim 13).

Applicant, therefore, submits that the inventions set forth among Groups I and II, as identified by the Examiner, relate to the same general inventive concept under PCT Rules 13.1 and 13.2 and respectfully requests reconsideration and withdrawal of the restriction requirement and examination of claims 13-25 on the merits. Applicant respectfully submits that claims 13-25 are allowable over the references of record herein.

#### **Oath/Declaration**

The oath or declaration has been objected to as being defective. Applicant submits herewith, a newly executed declaration which includes both residence and mailing addresses for the inventor.

#### **Drawings**

The drawings have been objected to as failing to show reference numeral “5” as mentioned in the disclosure. Applicant has amended the specification to remove the reference numeral “5” and, therefore, submits that no drawing corrections are required.

#### **35 U.S.C. § 112 Claim Rejections**

Claims 4 through 6 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. More particularly, the Examiner states that the phrase “each of the flow control devices” in claim 4, line 2, lacks proper antecedent basis.

Applicant has amended claim 4, as well as claim 1 from which claim 4 depends, to recite "at least one flow control device" and remove any perceived ambiguity in the claim language.

### 35 U.S.C. § 102(b) Anticipation Rejections

#### Anticipation Rejection Based on U.S. Patent No. 4,997,574 to Sarunac

Claims 1 through 5, 7, 9, and 10 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Sarunac (U.S. Patent No. 4,997,574). Applicant respectfully traverses this rejection, as hereinafter set forth.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Brothers v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Claim 1, as amended herein, is directed to an apparatus for disinfection of waste water. The apparatus comprises: an elongated passageway; at least two injection devices respectively located at spaced dosing locations along the passageway for introduction of a disinfectant to a stream of waste water flowing through the passageway; a source of disinfectant; a conduit arrangement extending between the disinfectant source and each of the dosing locations; and at least one flow control device positioned to regulate flow of disinfectant to each of the at least two injection devices through the conduit arrangement wherein *the at least one flow control device is configured to provide a lesser regulated flow of disinfectant through each injection device than a regulated flow of disinfectant through an injection device located upstream therefrom*. Applicant submits that Sarunac fails to teach all of the limitations as set forth in claim 1 of the presently claimed invention.

The Examiner cites Sarunac as disclosing a system comprising: a plurality of injection devices (25) spaced along an elongated plow path of a contact tank; a source of chlorine a conduit arrangement in communication with the chlorine source; and flow control devices (65,

75) operably coupled to a controller (60, 70). However, the Examiner does not cite Sarunac as teaching, nor does Applicant find a teaching in Sarunac regarding, the at least one flow control device being configured to provide a lesser regulated flow of disinfectant through each injection device than a regulate flow of disinfectant through an injection device located upstream therefrom. As such, Applicant submits that claim 1 is not anticipated by Sarunac and respectfully requests reconsideration thereof.

Applicant further submits that claims 2 through 5, 7, 9, and 10 are allowable over Sarunac by virtue of their dependency form an allowable base claim, as well as for the additional patentable subject mater introduced thereby.

With respect to claim 10, Applicant submits that Sarunac fails to teach a source of dosing liquid in communication with the source of disinfectant.

Applicant, therefore, respectfully requests reconsideration and allowance of claims 1 through 5, 7, 9 and 10.

Anticipation Rejection Based on British Patent No. 1 263 916

Claims 1, 4, 7, and 8 stand rejected under 35 U.S.C. § 102(b) as being anticipated by British Patent No. 1 263 916 (hereinafter the '916 reference). Applicant respectfully traverses this rejection, as hereinafter set forth.

The Examiner cites '916 reference as disclosing a system for disinfecting wastewater comprising a plurality of evenly spaced metering points D for injecting a disinfectant in the flow path of a paper machine. The Examiner further cites the '916 reference as disclosing a control unit C which communicates with valves (1-6) to control the dosing of disinfectant from a tank T. However, Applicant submits that the '916 reference fails to teach that *the at least one flow control device is configured to provide a lesser regulated flow of disinfectant through each injection device than a regulated flow of disinfectant through an injection device located upstream therefrom.*

Rather, it appears that the teachings of the '916 reference are contrary to the subject matter set forth in claim 1 of the presently claimed invention. For example, with reference to

FIG. 3, the '916 reference states that "[q]uantities of slime-inhibiting substance are dispensed at metering points D1 to D4." ('916 reference, page 2, lines 120-122). The graph shown in FIG. 3, to which the above statement refers, indicates that the quantity of slime-inhibiting substance being introduced is equivalent at each dosing point (D1-D4).

Applicant, therefore, submits that claim 1 is clearly not anticipated by the '916 reference. Applicant further submits that claims 4, 7, and 8 are allowable at least by virtue of their dependency from an allowable base claim. Applicant respectfully requests reconsideration and allowance of claims 1, 4, 6 and 8.

Anticipation Rejection Based on U.S. Patent No. 3,760,829 to Schuk et al., as Evidenced by U.S. Patent No. 3,732,164 to Pressley et al.

Claims 1, 2, 4 through 6, and 10 through 12 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Schuk et al. (U.S. Patent No. 3,760,829), as evidenced by Pressley et al. (U.S. Patent No. 3,732,164). Applicant respectfully traverses this rejection, as hereinafter set forth.

The Examiner cites Schuk as disclosing a system for disinfecting wastewater comprising a plurality of injectors spaced along a flow path in communication with a chlorine supply. The Examiner further cites Schuk as disclosing the dosing of chlorine to be controlled by valves (9 and 15) which are coupled to a control system and which are control in response to outputs from sensors (4, 5, and 12). The Examiner cites Pressley, which Schuk incorporates by reference, for the use of injectors. However, Applicant submits that Schuk fails to teach that *the at least one flow control device is configured to provide a lesser regulated flow of disinfectant through each injection device than a regulated flow of disinfectant through an injection device located upstream therefrom.*

Applicant notes that Schuk discloses two different injection points for injecting chlorine (i.e., through valves 8 and 15 as shown in FIG. 2), with the first dosing location (valve 15) being used to "predose" the wastewater with chlorine and thereby alter the alkalinity thereof prior to introduction of chlorine through the second dosing location (valve 9). However, Applicant

submits that Schuk fails to teach that the dose of chlorine being supplied through the second dosing location (valve 9) is less than that which is supplied through the first dosing location (valve 15). (See, e.g., col. 5, line 47 through col. 6, line 29).

Applicant, therefore, submits that claim 1 is clearly not anticipated by Schuk and respectfully request reconsideration thereof.

Applicant further submits that claims 2, 4 through 6, and 10 through 12 are allowable over Schuk by virtue of their dependency from an allowable base claim, as well as for the additional patentable subject matter introduced thereby.

With respect to claim 12, Applicant submits that Schuk fails to teach a post-treatment unit positioned downstream of the passageway, the at least one post-treatment unit being operable to further treat the wastewater discharged from the passageway.

Applicant, therefore, respectfully requests reconsideration and allowance of claims 1, 2, 4 through 6, and 10 through 12.

**ENTRY OF AMENDMENTS**

The amendments to claims 1 through 6, 8 through 13 and 15 through 22 above should be entered by the Examiner because the amendments are supported by the as-filed specification and drawings and do not add any new matter to the application.

**CONCLUSION**

Claims 1 through 25 are believed to be in condition for allowance, and an early notice thereof is respectfully solicited. Should the Examiner determine that additional issues remain which might be resolved by a telephone conference, he is respectfully invited to contact Applicant's undersigned attorney.

Respectfully submitted,



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**IN THE CLAIMS:**

Please note that all claims currently pending and under consideration in the referenced application are shown below. Please enter these claims as amended. This listing of claims will replace all prior versions and listings of claims in the application.

Please amend claims 1-6, 8-13 and 15-22 as set forth below.

**Listing of Claims:**

1. (Presently Amended) An apparatus for disinfection of waste water comprising:  
an elongated passageway ~~(15)~~;  
at least two injection devices respectively located at spaced dosing locations ~~(1, 2, 3, 4)~~ along the  
passageway ~~(15)~~ for introduction of a disinfectant to a stream of waste water flowing  
through the passageway; ~~(15)~~;  
a source of disinfectant; ~~(30)~~;  
a conduit arrangement ~~(35)~~ extending between the disinfectant source ~~(30)~~ and each of the dosing  
locations; ~~(1, 2, 3, 4)~~; and  
~~an adjustable~~ at least one flow control device ~~(60)~~ positioned to regulate flow of disinfectant to  
each of the at least two injection devices through the conduit arrangement ~~(35)~~ characterized  
in that wherein the at least one adjustable flow control device is devices (60) are, in  
combination, configured to provide a lesser regulated flow of disinfectant through each  
respective injection device than a regulated flow of disinfectant through an injection device  
located upstream therefrom.
2. (Presently Amended) The apparatus of claim 1, wherein said source of disinfectant ~~(30)~~  
comprises, at least in part, a source of chlorine ~~(30)~~.
3. (Presently Amended) The apparatus of claim 1, wherein said passageway ~~(15)~~ is  
defined within a contact tank ~~(10)~~.

4. (Presently Amended) The apparatus of claim 1, further comprising a controller (65) operably coupled to each flow control device of the at least one flow control device devices (60) to initiate adjustment of a regulated flow of disinfectant to each of the at least two injection devices.

5. (Presently Amended) The apparatus of claim 4, further comprising at least one sensor device (70) positioned in the passageway (15) and configured to sense at least one parameter usable for determining a desirable flow of disinfectant into the waste water, the at least one sensor device (70) being operably coupled to the controller (65), the controller being programmed to initiate adjustment of the at least one ~~of the~~ flow control device devices (60) to vary a flow of disinfectant therethrough responsive at least in part to an output signal from the at least one sensor device (70).

6. (Presently Amended) The apparatus of claim 4, wherein the controller (65) is configured to initiate adjustment of the at least one ~~of the~~ flow control device devices (60) to vary a flow of disinfectant therethrough responsive at least in part to a flow rate of the waste water stream and a disinfectant demand of the waste water stream proximate at least one dosing location (1, 2, 3, 4).

7. (Original) The apparatus of claim 1, wherein the plurality of injection devices is in excess of two injection devices.

8. (Presently Amended) The apparatus of claim 7, wherein the dosing locations (1, 2, 3, 4) are spaced at substantially equal intervals.

9. (Presently Amended) The apparatus of claim 1, wherein each of the injection devices comprises a group of injectors (40) fed by a single conduit of the conduit arrangement (35).

10. (Presently Amended) The apparatus of claim 1, further including a source of dosing liquid (45) in communication with the source of disinfectant (30).

11. (Presently Amended) The apparatus of claim 1, further comprising at least one pretreatment (90) unit upstream of the passageway (15), the at least one pretreatment unit (90) being operable to treat the waste water stream to enhance the effectiveness of the disinfectant.

12. (Presently Amended) The apparatus of claim 1, further including at least one post-treatment unit (100) positioned downstream of the passageway (15), the at least one post-treatment unit (100) being operable to further treat the wastewater discharged from the passageway.

13. (Withdrawn) A method of disinfection of waste water comprising:  
flowing waste water along an elongated flow path; (15) and  
introducing a disinfectant into the waste water at a plurality of space dosing locations (1, 2, 3, 4)  
along the elongated flow path; and characterized by  
controlling a dosage of disinfectant to each of the plurality of dosing locations (1, 2, 3, 4)  
wherein each dosage of disinfectant is less than a dosage of disinfectant introduced into  
the waste water at a dosing location upstream thereof.

14. (Withdrawn) The method of claim 13, wherein introducing a disinfectant comprises, at least in part, introducing chlorine.

15. (Withdrawn) The method of claim 13, wherein said flow path (15) is defined within a contact tank.

**Application Serial No. 10/009,888**

16. (Withdrawn) The method of claim 13, further including selecting proportional dosages of disinfectant among the plurality of dosing locations such that an effective level of disinfectant is maintained along the flow path (~~15~~) employing a total amount of disinfectant less than an amount of disinfectant required for dosing at a single location to maintain the effective level.

17. (Withdrawn) The method of claim 16, wherein selecting is based at least in part on a flow rate of the waste water and a disinfectant demand of the waste water proximate at least one dosing location (~~1, 2, 3, 4~~).

18. (Withdrawn) The method of claim 16, further including providing a plurality of dosing locations (~~1, 2, 3, 4~~) in excess of two dosing locations.

19. (Withdrawn) The method of claim 18, further including spacing the dosing locations (~~1, 2, 3, 4~~) at substantially equal intervals along the elongated flow path (~~15~~).

20. (Withdrawn) The method of claim 13, further including providing a source of disinfectant (~~30~~) and directing the disinfectant from the source to each of the plurality of dosing locations (~~1, 2, 3, 4~~).

21. (Withdrawn) The method of claim 20, further including varying the dosage of disinfectant introduced into the waste water at at least one of the plurality of dosing locations (~~1, 2, 3, 4~~) at least in part responsive to at least one parameter sensed in the waste water.

22. (Withdrawn) The method of claim 20, further including providing a source of dosing liquid (~~45~~), mixing the disinfectant with the dosing liquid and carrying the disinfectant to the dosing locations (~~1, 2, 3, 4~~) using the dosing liquid.

23. (Withdrawn) The method of claim 22, further including providing the dosing liquid by diverting a portion of the waste water.

24. (Withdrawn) The method of claim 13, further comprising pretreating the waste water upstream of the first dosing location.

25. (Withdrawn) The method of claim 13, further comprising post-treating the waste water downstream from the last dosing location.